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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/781,845

02/20/2004

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EXAMINER

DOVE, TRACY MAE

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

12/07/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/781,845

**Applicant(s)**

MATSUMOTO ET AL.

**Examiner**

Traçy Dove

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 October 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 9-14 and 16-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                                            |                                                                                         |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                           | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

## **DETAILED ACTION**

This Office Action is in response to the communication filed on 10/18/07. Applicant's arguments have been considered, but are not persuasive. Claims 1-18 are pending. Claims 9-14 and 16-18 are withdrawn from consideration. This Action is FINAL.

### ***Election/Restrictions***

Applicant's election of Group I in the reply filed on 4/5/07 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

### ***Claims Analysis***

The claimed invention is directed toward a fuel cell stack, not a method of operating a fuel cell stack. Limitations regarding a method of operating are not given patentable weight unless such limitations impart structure to the claimed fuel cell stack.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 7, 8 and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Skala et al., US 6,911,277.

Skala is directed toward fuel cell systems, and more particularly, to a device and method to expand an operating range of a fuel cell stack (1:8-10). Skala arranges portions of a fuel cell stack in series and allows the stack flow paths to be reconfigured dependent on flow throughput such that pressure drop remains reasonable while providing sufficient velocities and reactant concentrations at each cell. An array of valves are provided inside the fuel cell stack anode and/or cathode manifolds that open and close in a way that causes the respective gas flow paths through the cells of the stack to change as the throughput of the stack changes (1:63-2:5). The stack 10 includes a plurality of membrane electrode assemblies (MEAs) 20 each disposed between a plurality of bipolar plates 22. As is known in the art, the stack 10 also includes a plurality of gas distribution layers, a plurality of anode manifolds, a plurality of cathode manifolds, a plurality of coolant manifolds, and upper and lower end plates, all arranged in a stacked relation (2:63-3:8). The bipolar plates 22 define passages for the reactant gases to be distributed over the face of the corresponding anode and cathode catalyst layers of the MEA (2:14-16). Rotary sector valves 40,42 are capable of altering the flow path configuration through the fuel cell stack (3:25-42). Changing the flow path configuration with the stack throughput improves the operating range by keeping gas velocities sufficiently high to keep the channels clear of water (4:11-14). The manifold system of the fuel cell stack includes a flow control mechanism that is adjustable to provide alternative flow path arrangements through the plurality of reactant gas passages. The alternative flow path arrangements include the flow control mechanism connecting the plurality of reactant gas passages in differing parallel and series flow connections in which a first subset of said plurality of reactant gas passages are connected to the manifold system for parallel flow relative to one another and a second subset of the plurality of

reactant gas passages are connected to the manifold system for parallel flow relative to one another and are connected in series flow relationship to the first subset such that said flow control mechanism is adjustable to change with of said plurality of reactant gas passages are connected in parallel flow relationship and which subsets are connected in series flow relationship (claim 1). Note the bipolar plates 22 have at least two inlet manifolds, one for the fuel gas and one for the oxidant gas. Thus the claims are anticipated.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-6 rejected under 35 U.S.C. 103(a) as being unpatentable over Skala et al., US 6,911,277.

See discussion of Skala above regarding claims 1 and 2. Skala does not explicitly teach the valve/manifold structure of pending claim 3.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because Skala teaches rotary sector valves capable of altering the flow path configuration through the fuel cell stack. Changing the flow path configuration with the stack throughput improves the operating range by keeping gas velocities sufficiently high to keep the channels clear of water. One of skill would have been motivated to modify the valve structure of Skala to improve the operating range of the fuel cell stack and control the gas velocities in each channel. The manifold system of the fuel cell stack includes a

flow control mechanism that is adjustable to provide alternative flow path arrangements through the plurality of reactant gas passages.

***Response to Arguments***

Applicant's arguments filed 10/18/07 have been fully considered but they are not persuasive. Applicant argues Skala fails to disclose such a structural configuration of connected or linked cells recited by the claimed invention. Applicant asserts Skala merely discloses sector valve members 40 and 42 in which a change of path is limited to within a discrete cell in the stack, not between a plurality of linked cells. It is unclear to the Examiner how Applicant reaches this conclusion regarding the teachings of Skala. As described by the Examiner, Skala discloses alternative flow path arrangements include the flow control mechanism connecting the plurality of reactant gas passages in differing parallel and series flow connections in which a first subset of said plurality of reactant gas passages are connected to the manifold system for parallel flow relative to one another and a second subset of the plurality of reactant gas passages are connected to the manifold system for parallel flow relative to one another and are connected in series flow relationship to the first subset such that said flow control mechanism is adjustable to change with of said plurality of reactant gas passages are connected in parallel flow relationship and which subsets are connected in series flow relationship. The disclosure of a "subset" by Skala is contrary to Applicant's assertion that Skala is limited to a change of path within a discrete cell in the stack and not between a plurality of linked cells.

Applicant argues the configuration as recited by the pending claims can achieve the effect of providing a reliable fuel cell that addresses flooding and low-load performance problems while maintaining a steady gas flow rate during low load operation. Examiner points out the

claims are not directed toward a method of operating a fuel cell. Furthermore, Skala teaches changing the flow path configuration with the stack throughput improves the operating range by keeping gas velocities sufficiently high to keep the channels clear of water (addresses flooding) (4:11-14).

Applicant further argues Skala does not teach a means for supplying gas to the plurality of separators parallelly during a first power mode and serially during a second power mode. Examiner disagrees. Skala discloses alternative flow path arrangements include the flow control mechanism connecting the plurality of reactant gas passages in differing parallel and series flow connections in which a first subset of said plurality of reactant gas passages are connected to the manifold system for parallel flow relative to one another and a second subset of the plurality of reactant gas passages are connected to the manifold system for parallel flow relative to one another and are connected in series flow relationship to the first subset such that said flow control mechanism is adjustable to change with of said plurality of reactant gas passages are connected in parallel flow relationship and which subsets are connected in series flow relationship.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

Application/Control Number:  
10/781,845  
Art Unit: 1795

Page 7


will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is 571-272-1285. The examiner can normally be reached on Monday-Thursday (9:00-7:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

December 5, 2007

  
TRACY DOVE  
PRIMARY EXAMINER